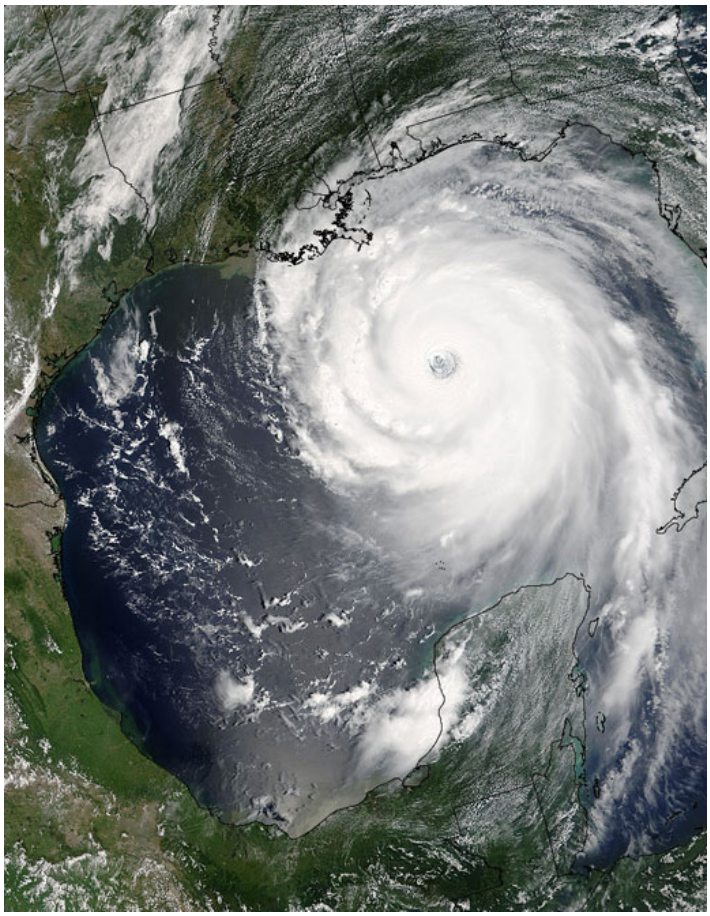
Hurricane Katrina Arizona Epidemiology Report

Office of Infectious Disease Services
Arizona Department of Health Services

December 2005



Courtesy NASA. Satellite image from 8/29/2005.

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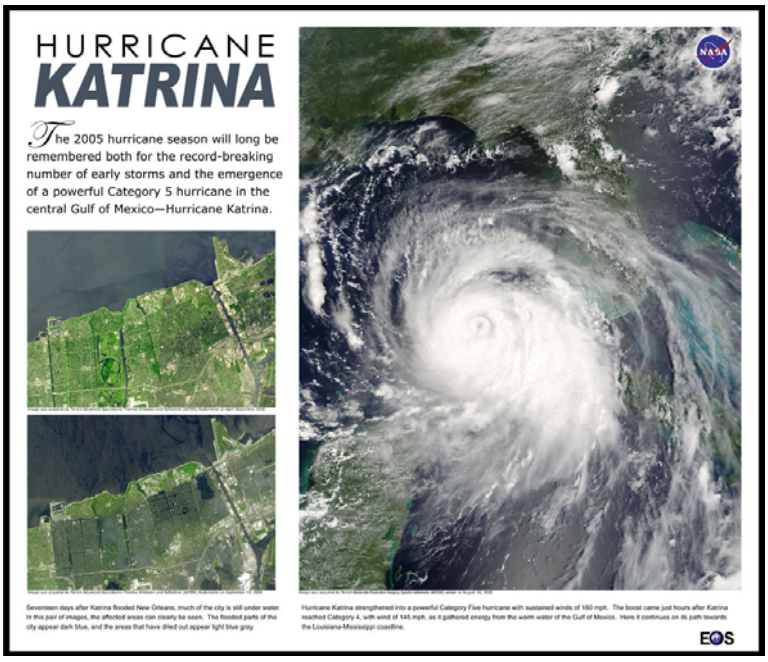


Summary:

New Orleans, Louisiana, and surrounding areas were struck by Hurricane Katrina on the morning of Monday, August 29th, 2005. Five hundred seventy-six evacuees were flown to Phoenix, Arizona, on Saturday, September 3rd and 4th. The Arizona Department of Health Services coordinated a medical clinic on-site at the Phoenix shelter, with services provided by many local hospitals and organizations. The clinic operated from September 4th through September 17th, serving evacuees housed at the shelter as well as other evacuees who arrived in the community by themselves. Medical and epidemiological data were collected at the medical clinic, and other data were obtained from various organizations providing health services to evacuees. In total, 826 patients were seen at the clinic, for a total of 1427 visits. No outbreaks were detected, though many patients reported symptoms potentially indicative of an infectious etiology, and several infectious diseases were identified among patients. Several lessons were learned about preparations for future responses.

Figure 1. Evacuees entering the temporary shelter at the Arizona Veterans Memorial Coliseum.

Introduction:

New Orleans, Louisiana, and surrounding Gulf Coast areas were struck by Hurricane Katrina on the morning of Monday, August 29th, 2005. Katrina was a Category 4 hurricane when it struck the Gulf Coast. The direct effects of the hurricane were exacerbated by the breach of the New Orleans levees soon after. Residents from affected areas were evacuated to sites around the country in the hours and days that followed.

Knowing that Arizona might be asked to host evacuees, the Arizona Department of Health Services (ADHS) had drafted a Public Health Incident Management System (PHIMS) chart by Friday, September 1st, to assemble a core group of responders and assign responsibilities. That afternoon, the Governor's Office contacted ADHS with the information that it was likely that Arizona would receive evacuees from the New Orleans area. The Veterans Memorial Coliseum at the Arizona State Fairgrounds was identified as the location where evacuees could be housed in Arizona.

The American Red Cross asked ADHS for support in assembling a medical and behavioral health triage clinic for the evacuees. ADHS organized these clinics, which were staffed by volunteers from local hospitals. Three flights arrived in Phoenix on Saturday, September 3rd, and one flight Sunday morning, with a total of 576 evacuees. The medical clinic began operations on Sunday, September 4th and continued with 24-hour staffing until closing at noon on Saturday, September 17th. The shelter remained open an additional four days until other accommodations could be found for all evacuees. Services at the shelter, including the medical clinic, were open to all persons who had obtained a Federal Emergency Management Agency (FEMA) identification number. Thus, persons who had self-evacuated to the Phoenix area were eligible for medical attention, not only the original 576.

On September 7th, an additional flight with 82 evacuees arrived in Tucson. Pima County arranged a separate shelter and medical clinic for these evacuees. Evacuees at this shelter were quickly relocated to the community, and the shelter closed after four days.

During the two weeks of medical clinic operations in Phoenix, local organizations and the medical community contributed many resources to assist the evacuees. Medical clinic operations alone depended on the support and services of many organizations. The intent of this report is to examine the epidemiological data collected during the event and to discuss successes and limitations of the methods and sources of data collection for instructing operations during any future public health emergency responses.

Data sources:

Data were collected by many different organizations providing services to evacuees at the Coliseum. A description of the data sources contributing to this report is below.

Shelter registration data: The American Red Cross was responsible for overall shelter organization and the registration of evacuees. Data collected included name, sex, age, place of

origin, date of registration, whether the evacuee had left the shelter, and FEMA number. This database was provided to ADHS on the eighth day of shelter operations (9/11/2005). Final data were not available to ADHS.

Clinic data: ADHS opened the medical clinic on September 4th; paper medical records were used throughout clinic operations. A temporary database was used between September 6th and 8th. By September 8th, a revised medical records form and database were created and were in use by that evening. Data from medical records were entered into the database on site. Data were retrieved each day for analysis at ADHS. Final data are included here. The medical intake form is included as Appendix III: Figure A.

Clinic syndrome tally: CDC made available a form, "Tool for surveillance among facilities housing Hurricane Katrina evacuees", on September 10th to assist in outbreak detection. It had become apparent by this time that a lag in data entry of medical records could prevent early detection of outbreaks through medical record data. Use of the CDC form at the Arizona medical clinic began September 11th. This form was faxed daily to CDC and retained at ADHS. The CDC form is included as Appendix III: Figure B.

Red Cross First Aid station data: The Red Cross operated the First Aid station at the shelter, where evacuees could go for nonprescription medications or other assistance. Some conditions were referred to the ADHS medical clinic; others were managed at the station. Copies of records designated as "illness" visits were provided to ADHS after the medical clinic closed. There was no method to identify whether the patients that visited the First Aid station had also visited the medical clinic. The Red Cross form is included as Appendix III: Figure C.

Laboratory data: Clinical specimens from the medical clinic were sent to either the Arizona State Laboratory (ASL) or Sonora Quest Laboratories. Results of all tests (positive or negative) were provided to ADHS.

Vaccination data: Maricopa County Department of Public Health (MCDPH) provided vaccinations at a designated vaccination clinic at the shelter. Data about vaccinations given were provided to ADHS.

Emergency medical transport: Emergency medical transport staff from PMT Ambulance were on site during clinic operations. Staff provided ADHS with copies of the transport log, which included FEMA number, date and time of transport, destination, and reason for transport.

Hospital surveillance: Active hospital surveillance was conducted by MCDPH to detect emergency department visits by evacuees, whether FEMA- or self-evacuated. Reports were distributed by MCDPH each weekday. The hospital form is included as Appendix II: Figure A. Hospital surveillance and emergency medical transport data were not cross-matched.

Pharmacy data: ValueOptions provided on-site pharmacy services in conjunction with staffing from local pharmacies during shelter operations. Data on prescriptions filled were provided to ADHS after the pharmacy closed.

Tucson data: Pima County Health Department (PCHD) was responsible for surveillance among the Tucson evacuees. Tucson data provided by PCHD are shown at the end of the Results section; all other data refer only to Phoenix evacuees.

Results:

Shelter population:

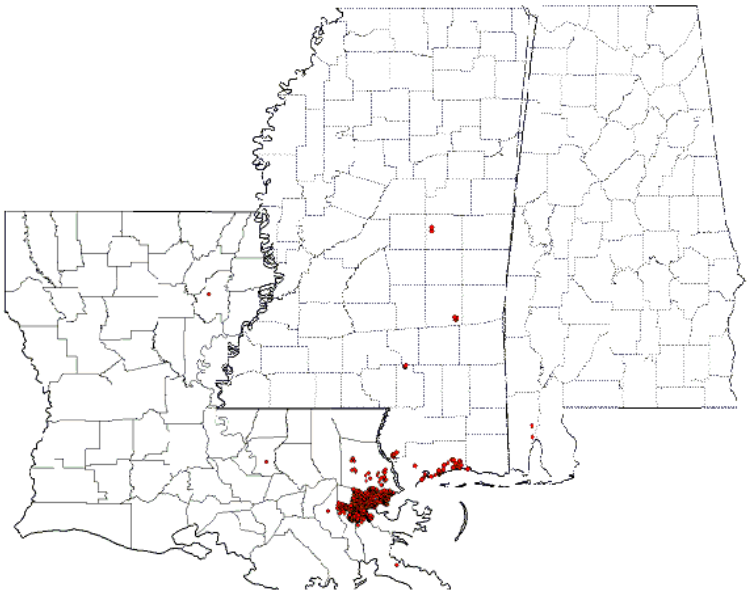
Red Cross data were analyzed to obtain basic demographic information about evacuees at the shelter. A total of 900 persons were listed in the Red Cross database. While this number is much higher than the number of evacuees staying at the shelter at any one time, there may have been additional evacuees that utilized services at the shelter without staying there. It could also indicate unrecognized duplicates within the database.

More than half of Phoenix evacuees were male, and the majority were adults ages 18 to 64 years (Table 1). Children under age 18 years represented 173 (20%) of those registered. Figure 2 indicates the place of origin of registered evacuees; 68% came from New Orleans.

Table 1. Red Cross registration data

Total		900
Sex	Male	462 (51%)
	Female	356 (40%)
	Unknown	82 (9%)
Age group	0-4y	41 (5%)
	5-17y	132 (15%)
	18-64y	510 (57%)
	65+ y	94 (10%)
	Unknown	123 (14%)
Date registered	9/4/2005	409 (45%)
	9/5/2005	83 (9%)
	9/6/2005	18 (2%)
	9/7/2005	17 (2%)
	9/8/2005	62 (7%)
	9/9/2005	73 (8%)
	9/10/2005	123 (14%)
	9/11/2005	52 (8%)

Figure 2. Place of origin of registered Phoenix evacuees.



Clinic patients:

A total of 826 patients visited the medical clinic during the two weeks of operations. Patient age and sex are shown in Table 2. Approximately equal numbers of men and women were seen; the majority of patients were adults. Clinic data were cross-matched with Red Cross registration data by FEMA number. Almost half of the patients did not match with data in the Red Cross database (many FEMA numbers were unavailable in the Red Cross database); the majority of those that matched had arrived the first day (Table 3).

Table 2. Medical clinic patient demographics.

	0-4y	5-17y	18-64y	65+	Unk	Total
Male	16 (2%)	33 (4%)	316 (38%)	52 (6%)	1 (0.1%)	418 (51%)
Female	13 (2%)	38 (5%)	269 (33%)	68 (8%)	3 (0.4%)	391 (47%)
Unknown	1 (0.1%)	5 (1%)	8 (1%)	0	3 (0.4%)	17 (2%)
Total	30 (4%)	76 (9%)	593 (72%)	120 (15%)	7 (1%)	826

Table 3. Date of registration at shelter.

Date Patient Registered at Shelter	
9/4/2005	257 (31%)
9/5/2005	45 (5%)
9/6/2005	7 (1%)
9/7/2005	3 (0.4%)
9/8/2005	26 (3%)
9/9/2005	28 (3%)
9/10/2005	49 (6%)
9/11/2005	17 (2%)
Unknown	394 (48%)

Data on certain pre-existing medical conditions were collected systematically as check boxes on the medical records form. Hypertension was the most commonly reported, at 23% of patients (Table 4). Ten and three patients reported HIV and tuberculosis, respectively; names of these patients were provided to the ADHS HIV/AIDS or MCDPH Tuberculosis programs for follow-up.

Table 4. Co-existing medical conditions.

Medical condition	Total*
Hypertension	192 (23%)
Diabetes	77 (9%)
Asthma	61 (7%)
Congestive heart failure	14 (2%)
Active drug use	12 (1%)
HIV	10 (1%)
Tuberculosis	3 (0.4%)
Other immunocompromised	7 (1%)
Other communicable disease	10 (1%)

* Some patients may have more than one comorbidity.

Clinic visits:

The medical clinic was staffed 24 hours per day for the duration of operations. Patients first visited the triage desk and were then sent into the medical area if warranted. A chart was completed on each patient, including those only visiting the triage area, and all information was entered into the medical records database. Because patients could be seen multiple times, the total number of visits (1427) is much greater than the number of patients seen (826). Follow-up visits and procedures that did not require the attention of a doctor, such as blood pressure checks, are all included as "visits". The largest number of visits in one day was on the first full day of operations, September 5th, and traffic was highest during the first week (Figure 3 and Table 5). A count of visits to the triage area was collected daily and helped assess data entry lag during clinic operations; this information was not available for all days and it is unclear why there is a discrepancy between triage counts and visits recorded in the medical records.

Figure 3. Number of visits per day to the medical clinic.

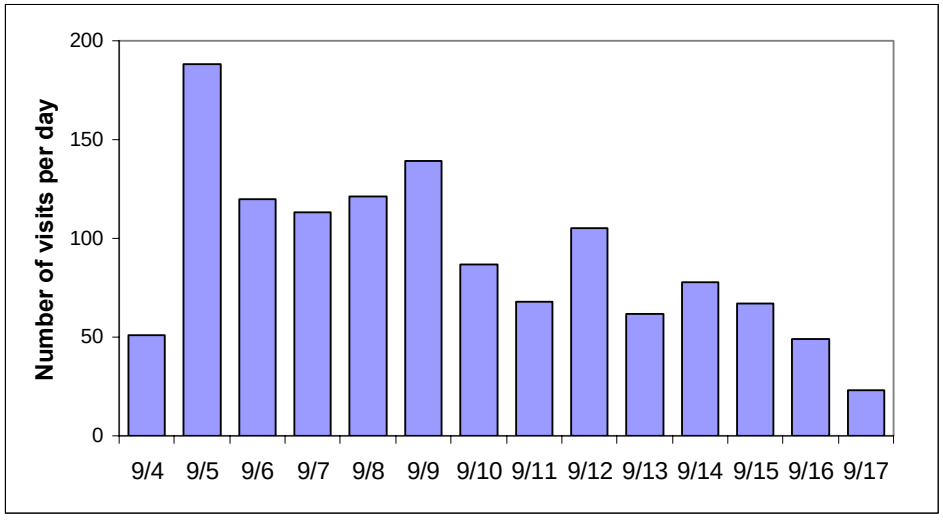
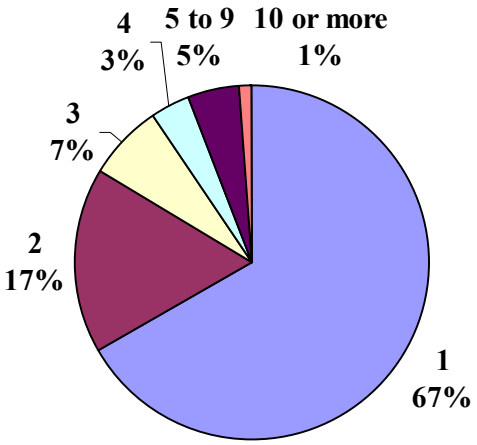


Table 5. Visits per day to the medical clinic.

	TOTAL	9/4	9/5	9/6	9/7	9/8	9/9	9/10	9/11	9/12	9/13	9/14	9/15	9/16	9/17	Unk
# clinic visits (per medical records)	1427	51	188	120	113	121	139	87	68	105	62	78	67	49	23	156
# clinic visits (per triage counts)	N/A	-	-	-	-	-	-	92	66	90	37	65	54	56	-	-

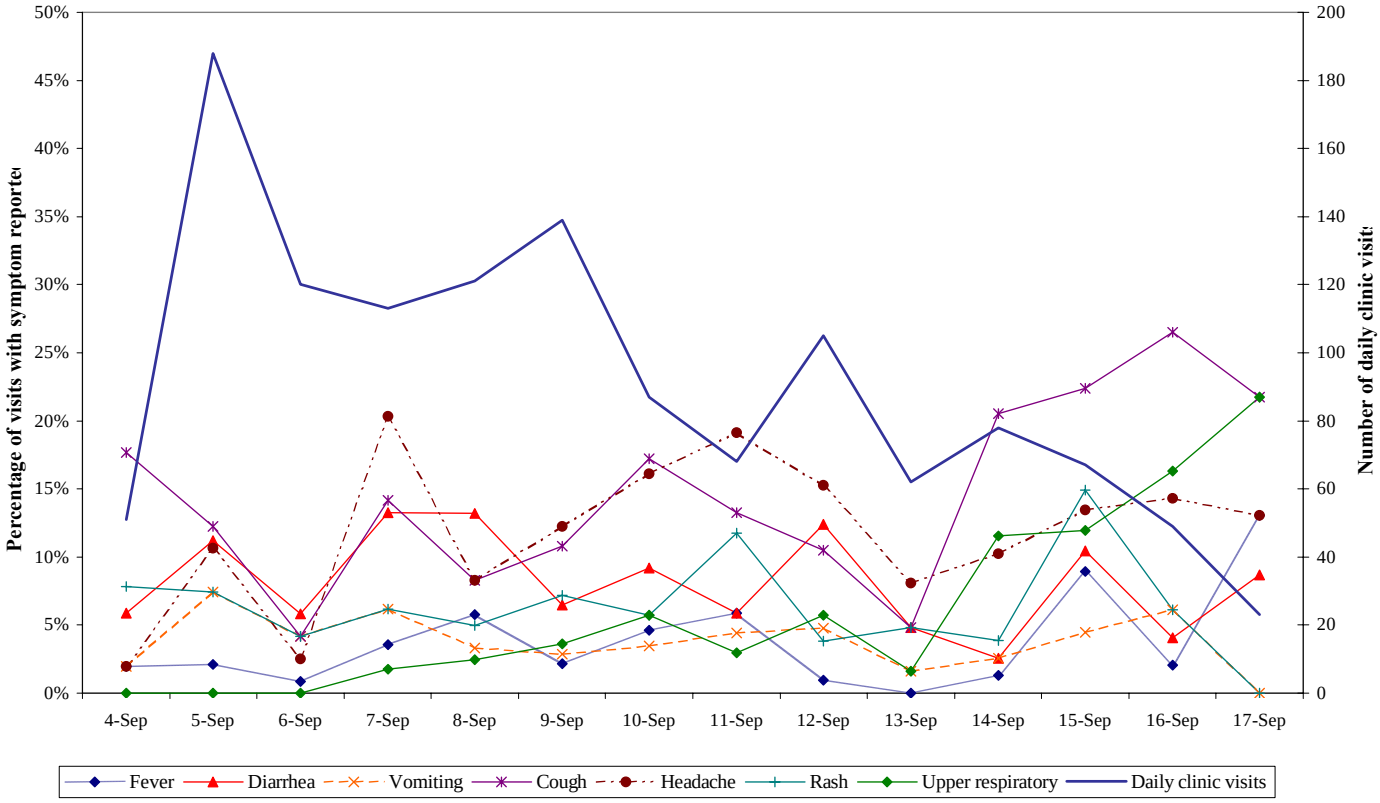
While two-thirds of patients utilizing the clinic visited only once, 27% of patients visited two to four times and 6% had five or more visits (Figure 4).

Figure 4. Number of visits to the medical clinic for each patient.



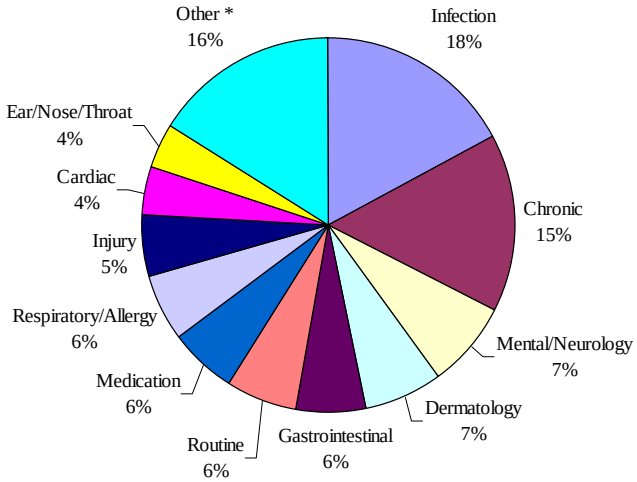
The medical records form used at the medical clinic included check boxes for common symptoms with potential for being indicators of an infectious disease outbreak. These included fever, diarrhea, cough, vomiting, headache, rash, conjunctivitis, and jaundice. These symptoms were monitored for spikes in any indicator. Of all visits, 381 (28%) listed one of the syndromes under observation. The percentage of daily visits with each of the more commonly observed symptoms is shown in Figure 5. The complete table of syndromes by day and sex and age group distribution of visits by day is included as Table A in Appendix I.

Figure 5. Percentage of visits with common syndromes/symptoms.



Principal diagnoses were listed by the physician for 888 visits. Principal diagnoses were then categorized by an ADHS physician. The most common categories were infection (18%) and chronic conditions (15%) (Figure 6). The complete table of principal diagnosis by day is listed as Table B in Appendix I.

Figure 6. Principal diagnostic categories of clinic visits.*



* Includes only visits with principal diagnosis listed, n=888. Other includes: Dental, Endocrinology, Obstetrics/ Gynecology, Immunization, Muscular, Ophthalmic, Pain, Renal, Rheumatology, Surgery, Urology, Vascular.

Clinic syndrome tally:

A tally of syndromes with "epidemic disease potential" was started on September 11th using the CDC form in order to have more timely data on any outbreak indicators (Table 6). No events of concern were detected.

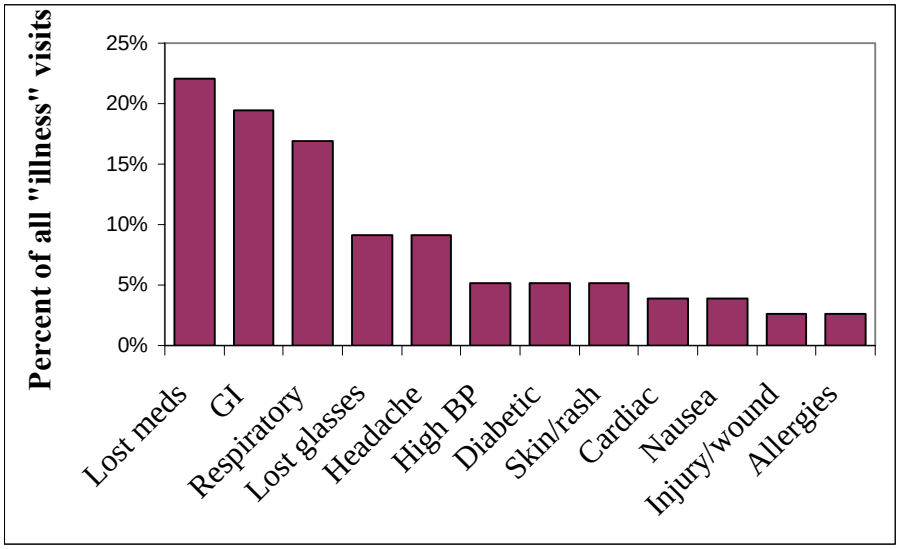
Table 6. Daily number of clinic visits with syndrome categories with outbreak potential (initiated 9/11).

	9/11	9/12	9/13	9/14	9/15	9/16
Number of clinic visits	66	90	37	65	54	56
Watery diarrhea & vomiting	1	1	1	0	3	4
Watery diarrhea, NO vomiting	2	2	3	2	2	0
Respiratory illness	2	4	0	6	2	0
Wound infections	3	1	1	0	0	0
Rash illness	10	1	2	1	3	2

Red Cross First Aid station data:

Records were kept for all visits to the Red Cross First Aid station; a total of 77 were designated as "illnesses" (rather than wound/injury). Complaints mentioned in those records are shown in Figure 7. There is a greater representation of gastrointestinal and respiratory symptoms in the First Aid station visits than among the medical clinic visits (Figure 6). Lost medications were the most commonly reported complaint at the First Aid station; lost glasses were also a common problem.

Figure 7. Complaints listed at "illness" visits to Red Cross First Aid station.



* More than one complaint may have been provided at each visit.

Laboratory data:

Clinical specimens were sent to either the Arizona State Laboratory (ASL) or Sonora Quest Laboratories. Twenty-five specimens were tested at ASL, on eleven patients. Specimens from

two patients were positive: *Vibrio cholerae* non-O1 serogroup (stool culture) and *Vibrio vulnificus* (wound culture). Fifteen specimens were tested at Sonora Quest. Positive results from Sonora Quest are as follows: 1 *Vibrio cholerae* (drug susceptibility testing for same patient identified by ASL above), 1 enterococcus, 2 methicillin-resistant *Staphylococcus aureus*, 1 methicillin-susceptible *Staphylococcus aureus*, 1 *Streptococcus* Group A and 1 *Streptococcus* Group B (all non-invasive).

Vaccinations:

MCDPH provided vaccinations at a separate, designated vaccination clinic at the shelter. This clinic expanded beyond tetanus-containing vaccines to provide other vaccines on September 13th and 14th. The number of vaccines given by vaccine type (Figure 8) and by date and recipient are shown below (Table 7). Adults received 95% of the vaccinations given; children received 5%. Td was also given when indicated to evacuees utilizing the medical clinic; 145 patients had tetanus-containing vaccine listed in their charts. However, Td received at the medical clinic cannot be easily distinguished from the 510 doses of tetanus-containing vaccine provided by MCDPH.

Figure 8. Vaccinations provided by MCDPH, by type.

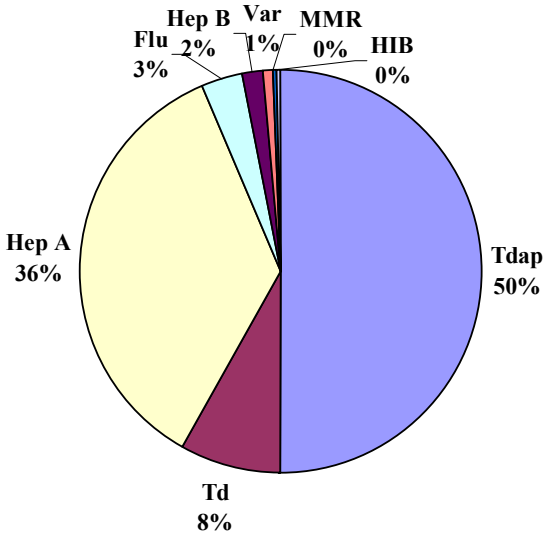


Table 7. Vaccinations given by MCDPH, by date and recipient.

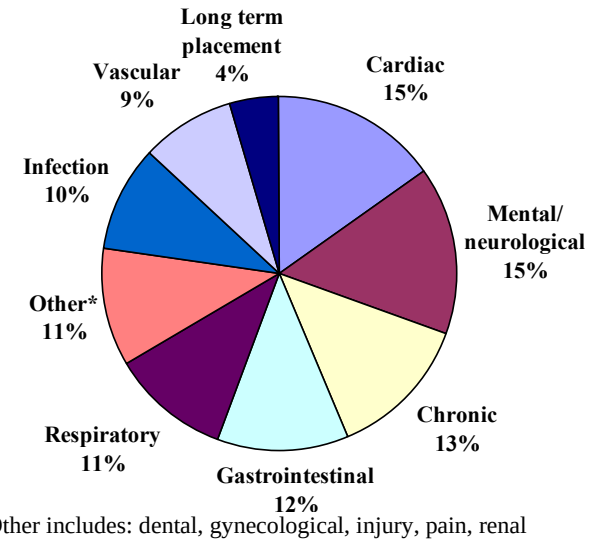
Date	9/2,3	9/4	9/5	9/6	9/7	9/8	9/9	9/12	9/13	9/14	9/15	9/16	Total
# Adult Evacuees	4	12	55	38	26	28	38	31	25	19	9	2	287
# Child Evacuees	1	0	5	5	1	5	5	0	1	1	5	2	31
# Volunteers	0	0	0	0	0	21	17	9	126	89	40	13	315
Total Vaccinated	5	12	60	43	27	54	60	40	152	109	54	17	633

Emergency medical transport:

Emergency medical transport services were on site throughout the duration of medical clinic operations. A total of 90 persons were transported during that time. Reasons for transport are

shown in Figure 9. A table of number of persons transported each day and reasons for transport is provided as Table C in Appendix I.

Figure 9. Reasons for emergency medical transport.



*Other includes: dental, gynecological, injury, pain, renal

Hospital surveillance:

Active hospital surveillance for persons self-reporting as Hurricane Katrina evacuees was conducted by MCDPH. This surveillance could detect visits to hospital emergency departments from evacuees staying at the Coliseum, those who had already left the Coliseum, or those who self-evacuated from the Gulf Coast to Maricopa County. One hundred thirty hospital visits were detected through this surveillance. The complete final report from MCDPH is included as Appendix II, Part B.

Pharmacy data:

ValueOptions provided data to ADHS from the on-site pharmacy. The pharmacy filled a total of 1,662 prescriptions during shelter operations and until September 28th. The majority of these were filled during the first week, with 21% filled on September 5th (Figure 10). Hypertensive medications, anti-inflammatory drugs, and antimicrobial medications together accounted for 50% of prescriptions filled (Figure 11).

Figure 10. Prescriptions filled at on-site pharmacy, by date.

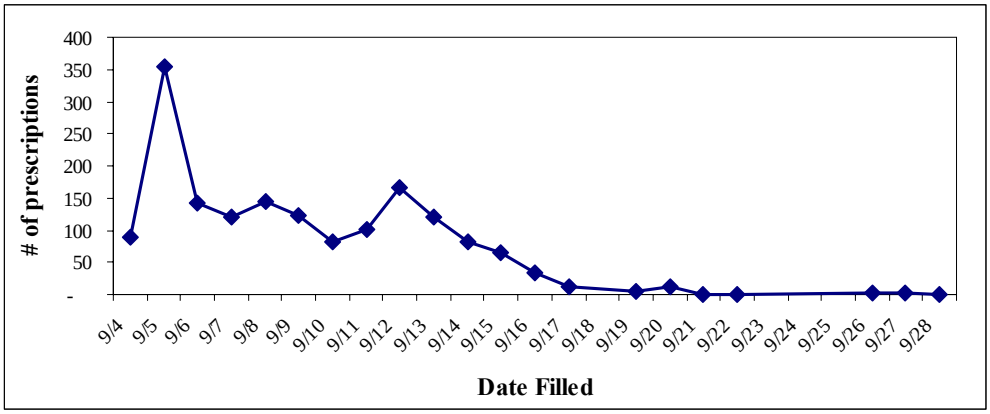
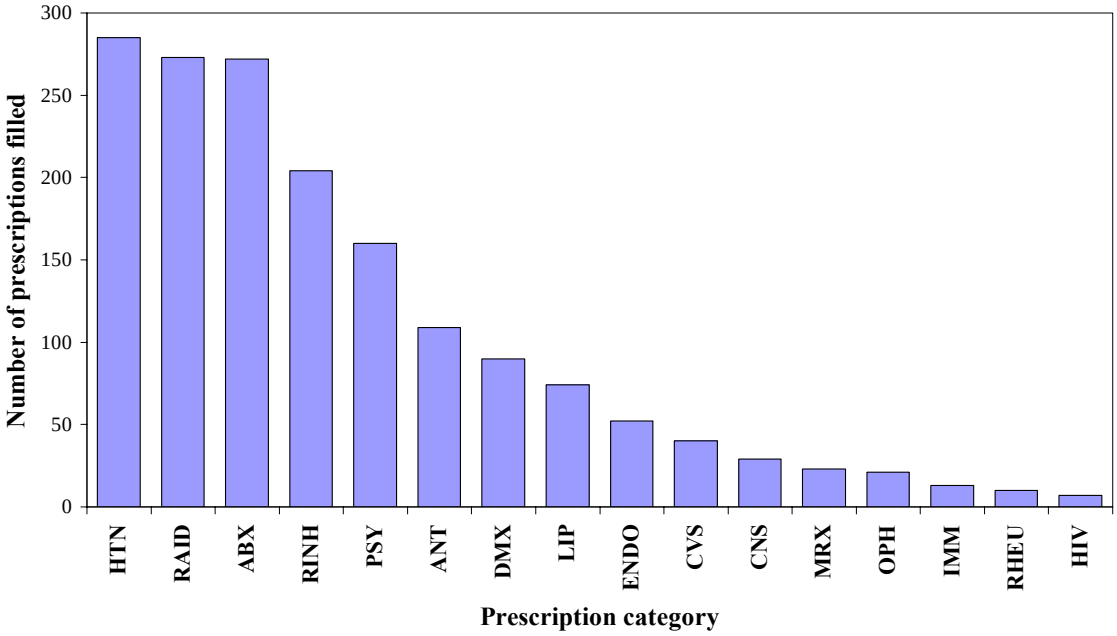


Figure 11. Number of prescriptions filled, by category.



ABX	antibiotics, antivirals, antifungals in any form
ANT	antacids, H2 blockers, protein pump inhibitor
CNS	anticonvulsants, anti-Parkinson
CVS	cardiac meds, angina meds, blood thinner e.g. warfarin
DMX	diabetic meds and equipment
ENDO	contraceptives, bone meds (incl. calcium), thyroid meds, adrenal meds
HIV	HIV meds
HTN	hypertensive meds
IMM	organ transplant meds, Procrit, cancer meds e.g. Tamoxifen
LIP	Lipid-lowering drugs
MRX	muscle relaxants
OPH	ophthalmic meds
RAID	aspirin, Tylenol, NSAIDS, migraine meds, creams, vitamins
RINH	inhalers, antihistamines, prednisone, cough meds

Behavioral health:

Behavioral health services were provided at the shelter. Referrals to behavioral health were noted in 90 (11%) of the medical charts. However, evacuees could also self-refer to behavioral health services and informal reports indicated that many more people utilized the services.

Outcomes:

No deaths were reported among evacuees while the shelter was operating. On-going mortality surveillance conducted by MCDPH did not identify any later deaths among evacuees attributable to the event. No outbreaks were detected. Infectious agents identified included a non-O1 *Vibrio cholerae* infection and several wound infections, including MRSA and *V. vulnificus*.

***Tucson data*:**

Pima County Health Department conducted surveillance among the 82 evacuees housed in Tucson. Surveillance data are shown in Tables 8 and 9; over half of evacuees reported at least one of the recorded symptoms.

Table 8. Surveillance data among Tucson evacuees.

Tucson evacuees	Evacuees with infectious symptoms	Percent with symptoms	Number with > 1 symptom	Percent with >1 symptom
82	43	52.4%	13	15.9%

Table 9. Symptoms noted among Tucson evacuees.

Cough	12
Diarrhea	12
Infected wound	9
Rash	8
Fever	7
Headache	7
Vomiting	2
Jaundice	0

Discussion:

No outbreaks were detected at the Coliseum, and while potential infectious disease indicators were reported at approximately a quarter of clinic visits, there were no indications of person-to-person transmission of infectious agents. Medical attention was provided to all evacuees reporting to the clinic.

Infection control:

Infection control at the shelter was of substantial concern, given the shelter setting and the suboptimal conditions that many evacuees had experienced prior to evacuation. An infection control plan and assessment were drafted (see Appendix IV) and daily infection control assessments were conducted of the Coliseum, including restrooms. Daily consultations with the Red Cross and clinic staff identified potential problems which were addressed by the infection control practitioner. Infection control supplies (e.g., hand sanitizer, tissues, disinfectant) were set up in the sleeping quarters. Hand sanitizer and tissues were also available in the social services area, cafeteria, and at the Coliseum entrance. Signs encouraging hand hygiene and respiratory hygiene were posted. Infection control supplies were replenished daily by the infection control practitioner. The infection control practitioner provided a brief discussion of infection prevention and control issues to evacuees.

There were initial concerns about the cleanliness of showers and restrooms. Additional janitorial coverage was provided by the Arizona Department of Corrections to allow 24/7 coverage at the Coliseum. ADHS also contracted with a private janitorial services company to clean and sanitize the medical clinic and other areas as needed.

Shelters in other states experienced outbreaks of norovirus among Katrina evacuees. In anticipation of this potential problem, only hypochlorite (bleach)-containing disinfectants were used by the janitorial and medical staff. Rapid cleaning and disinfecting of vomit/stool was encouraged. Evacuees were encouraged to speak to the Red Cross nurse or the medical clinic if vomiting or diarrhea occurred.

Vibrio spp. *findings*:

A non-O1 *Vibrio cholerae* infection and *V. vulnificus* wound infection were among the infections detected and laboratory-confirmed in Arizona, along with several other infections in wounds/injuries. Nationally, 22 cases of *Vibrio* illness were identified among persons from affected Gulf Coast states.[1] Eighteen were wound-associated cases (14 (82%) *V. vulnificus*, three (18%) *V. parahaemolyticus*). The other four were non-wound-associated illnesses; two were identified as non O1, non-O139 *V. cholerae*.

V. cholerae serogroups O1 and O139 can cause the disease cholera if they produce the cholera toxin, with epidemic potential. The other serogroups, the non-O1, non-O139 *V. cholerae*, cause a less severe diarrheal illness and are not of epidemic concern. An average of 44 cases of non-O1, non-O139 *V. cholerae* have been reported yearly in the U.S. in the past five years, and the natural reservoir for these bacteria is sea and coastal water.[2]

An average of 412 cases of noncholeragenic *Vibrio* illnesses have been reported nationally each year 2000 to 2004, with *V. parahaemolyticus*, *V. vulnificus*, and nontoxigenic *V. cholerae* being

[1] *Vibrio* Illnesses After Hurricane Katrina --- Multiple States, August--September 2005. CDC. Sept. 23, 2005. MMWR: 54(37);928-931.
[2] Fact sheet: Non-O1 and non-O139 *Vibrio cholerae*. CDC. Sept. 9, 2005.

the most commonly reported.[3] *V. vulnificus* usually causes wound infections and *V. parahaemolyticus* usually causes gastroenteritis with wound infections reported less frequently. The post-hurricane cases reported in the Gulf Coast states and among evacuees represent an increase over the incidence normally seen in those states. This increase is most likely due to infections of *Vibrio* spp. normally present in the environment but acquired through exposure to flood waters.

Limitations:

Despite the achievements and successes, there were several major limitations in the collection and rapid analysis of data. These are described in further detail for consideration in the planning for future events.

Timeliness of data used for outbreak detection: The medical record form was designed for the dual purposes of medical clinic intake and recording symptoms/syndromes potentially infectious in nature. This led to several factors that inhibited timely data assessment. First, late changes were made to both the form and the database; neither was finalized until the fourth day of clinic operations. Secondly, data entry staff were not able to keep up after the late start on data entry and timely data entry was not made a priority of the response. Without complete daily counts of symptoms, an outbreak cannot confidently be detected through these data. Prioritization of data entry by an on-site epidemiologist and implementation of the CDC surveillance form helped abet this problem. In the future, the epidemiological data collection tool needs to be separate from the medical form if entering full medical records makes timely data entry of epidemiologic data unfeasible.

Need for additional data: Several types of data necessary for better outbreak detection were not available during the response. Some of these were obtained for this report after the clinic closed. Data required include:

a. Nightly headcount or daily shelter population, to be used in calculating symptom rates, a better indicator than number. Partial data were available from the Red Cross but could not be used for daily counts, and a final database of shelter population was never available. Throughout clinic operations, symptoms/syndromes could only be analyzed by number, despite wide variability in shelter population, since denominators were not consistently available.
b. Triage tally of clinic visits, which helps to identify data entry lag and serves as quick tally of visits. This number can also serve as a denominator in lieu of shelter population. This was collected only partway through the response.
c. Method for distinguishing shelter vs. non-shelter evacuees seen at the clinic, which helps to establish more accurate rates and determine differences in health needs between shelter and non-shelter evacuees.

[3] *Vibrio* Illnesses After Hurricane Katrina --- Multiple States, August--September 2005. CDC. Sept. 23, 2005. MMWR: 54(37);928-931.

d. Red Cross First Aid station illness data. A cluster of linked cases could be split between the medical clinic and First Aid station, making it difficult to detect without better coordination with the Red Cross.
e. Patient tracking. There was no system for tracking whether evacuees were still living in the shelter, or where they had gone. Confirmation of many infectious illnesses requires laboratory testing. Intervention or follow-up may be required after confirmation. In addition to the need for knowing changes in the daily shelter population, as mentioned above, it may be critical for medical or epidemiology staff to locate certain individuals in order to prevent the spread of infectious agents in the shelter or the community.

Availability of other data sources: Data were never obtained from some of the other partners offering health services, and in some cases it was not clear whether data were being tracked. Data sources that were not available included: behavioral health and long term care placement. Vaccinations provided at the medical clinic (rather than at MCDPH's vaccination site) were difficult to track.

Communications: Enhanced communications between Emergency Operations Center staff and epidemiology staff, inclusion of epidemiologists in preparedness planning, and clarification of roles could help resolve some of the limitations mentioned above and others as they arise during a response.

In conclusion, during the two weeks that Arizona housed Hurricane Katrina evacuees at the Coliseum, medical care was made available and delivered to all evacuees requesting attention. No outbreaks or major health events occurred at the shelter. The epidemiological limitations identified during this event can be used to instruct surveillance preparations for future disaster responses. Given a situation with great potential for an infectious disease outbreak, early identification of outbreak indicators is critical. The data included in this report may also assist in providing baseline information for the types of chronic care or medical conditions that may need to be addressed in an emergency.

Figure 12. Beds set up for evacuees at the Coliseum, Phoenix, Arizona (before arrival).

Appendices

Appendix I: Additional data tables

A. Patient visits, by day

B. Principal diagnosis categories of clinic visits

C. EMT usage, by day

Appendix II: Active hospital surveillance (Maricopa County Department of Public Health)

A. MCDPH active hospital surveillance form

B. Final report

Appendix III: Forms

A. ADHS medical intake form

B. Tool for surveillance among facilities housing Hurricane Katrina evacuees (CDC)

C. Red Cross First Aid station form

Appendix IV: Infection Control

A. Shelter infection control plan

B. Daily infection control assessment

Appendix I. Table A. Patient Visits (Total = 1362)*

* N=1427 for sex and age group.
The difference represents visits during which a full clinical assessment was not documented and the other variables below were not captured.

		UNK	9/4	9/5	9/6	9/7	9/8	9/9	9/10	9/11	9/12	9/13	9/14	9/15	9/16	9/17	TOTAL
Sex	Male	100	35	106	75	62	73	63	43	41	48	36	42	34	27	15	800 (56%)
	Female	55	16	79	43	47	45	73	43	25	52	26	35	29	22	8	598 (42%)
Age group	0-4y	3	0	1	1	1	1	11	2	3	4	2	2	2	1	0	34 (2%)
	5-17y	10	1	7	10	11	9	15	8	5	4	1	5	3	1	0	90 (6%)
	18-64y	111	42	145	92	89	102	104	65	55	84	52	63	58	39	20	1121 (79%)
	65+ y	31	7	33	15	11	8	9	12	5	13	7	8	4	8	3	174 (12%)
Symptoms	Fever	7	1	4	1	4	7	3	4	4	1	0	1	6	1	3	47 (3%)
	Jaundice	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2 (0.2%)
	Diarrhea	14	3	21	7	15	16	9	8	4	13	3	2	7	2	2	126 (9%)
	Vomiting	7	1	14	5	7	4	4	3	3	5	1	2	3	3	0	62 (5%)
	Cough	10	9	23	5	16	10	15	15	9	11	3	16	15	13	5	175 (13%)
	Headache	8	1	20	3	23	10	17	14	13	16	5	8	9	7	3	157 (12%)
	Rash	8	4	14	5	7	6	10	5	8	4	3	3	10	3	0	90 (7%)
	Neurological	0	0	1	0	1	4	3	1	3	1	0	0	1	3	0	18 (1%)
	Conjunctivitis	1	0	2	0	1	0	1	2	0	0	0	0	0	2	2	11 (1%)
	Upper respiratory	0	0	0	0	2	3	5	5	2	6	1	9	8	8	5	54 (4%)
	Vomiting+Diarrhea	6	0	8	4	4	3	1	1	1	3	0	0	2	1	0	34 (3%)
	Influenza-like illness	1	1	2	0	2	1	1	2	2	1	0	1	5	0	2	21 (2%)
	Any of above symptoms	26	13	52	19	38	39	36	29	22	26	10	20	26	17	8	381 (28%)
Pregnant		0	0	0	1	1	0	1	0	0	1	0	1	0	0	1	6
Specimens collected		2	0	1	1	7	4	4	2	1	2	1	1	0	1	2	29 (2%)
RX given		56	47	139	68	74	76	81	55	38	73	39	56	42	35	14	893 (66%)
Referred to hospital*		7	5	12	4	9	6	5	3	1	2	1	4	2	4	1	66 (5%)

* Some patients may have been referred to hospital before shelter clinic triage. This number is therefore an underestimate.

Appendix I. Table B. Principal diagnosis categories of clinic visits (for visits with principal diagnosis listed, n=888)

	UNK	9/4	9/5	9/6	9/7	9/8	9/9	9/10	9/11	9/12	9/13	9/14	9/15	9/16	9/17	TOTAL
Cardiac	1	3	1	1	7	4	3	4	3	3	1	0	3	3	0	37
Chronic	6	8	19	8	13	9	12	8	5	13	12	8	8	3	4	136
Dermatology	3	3	7	2	4	5	6	5	8	4	3	2	8	0	1	61
Ear/Nose/Throat	3	0	3	1	3	4	4	3	1	5	0	2	0	4	2	35
Gastrointestinal	4	0	6	7	6	9	4	4	0	8	3	1	1	1	0	54
Infection	9	0	22	12	6	16	13	10	6	10	8	12	15	9	4	152
Injury	5	6	8	2	14	3	2	1	1	3	1	1	0	0	0	47
Medication	0	1	3	4	2	2	8	2	3	11	5	1	8	2	0	52
Mental/Neurology	0	0	5	1	3	10	15	3	6	7	6	3	2	3	2	66
Respiratory/Allergy	2	0	3	1	16	2	7	3	1	4	2	6	3	1	1	52
Routine	0	1	2	2	0	11	25	2	1	4	1	2	1	1	0	53
Other *	8	3	16	12	17	19	10	10	7	13	5	12	5	5	1	143

* Other includes: Dental, Endocrinology, Obstetrics/Gynecology, Immunization, Muscular, Ophthalmic, Pain, Renal, Rheumatology, Surgery, Urology, Vascular

Appendix I. Table C. Emergency medical transports.

	9/4	9/5	9/6	9/7	9/8	9/9	9/10	9/11	9/12	9/13	9/14	9/15	9/16	Total
Cardiac	2	2	1	1	4	2	0	1	0	0	0	1	0	14
Chronic	3	2	1	0	1	0	0	1	1	1	1	1	0	12
Gastrointestinal	1	3	2	3	0	0	1	0	1	0	0	0	0	11
Infection	1	6	0	0	0	2	0	0	0	0	0	0	0	9
Long term placement	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Mental/neurological	3	6	2	0	1	0	1	0	0	0	0	1	0	14
Respiratory	2	2	0	2	1	1	1	0	0	0	1	0	0	10
Vascular	1	2	1	1	0	0	1	2	0	0	0	0	0	8
Other*	5	1	1	1	1	0	0	0	0	0	1	0	0	10
Total	15	27	8	8	9	5	4	4	2	1	3	3	1	90

*Other includes: dental, gynecological, injury, pain, renal

Appendix II. Part A. MCDPH active hospital surveillance form & instructions

Dear Infection Control Practitioner and Emergency Department Staff,

These are instructions for active surveillance covering evacuees from the Gulf Coast area who may present at your emergency department.

Please coordinate this effort through your infection control practitioner.

As you all know Arizona Department of Health Services (ADHS) is coordinating the care of a large number (1000+) of evacuees from Hurricane Katrina housed at the Memorial Coliseum. All Emergency Departments and Infection Control Practitioners were alerted over the weekend that they may be receiving patients from this relief effort and that Maricopa County Department of Public Health (MCDPH) will be responsible for coordinating active surveillance with the hospitals.

Please provide the following information ONLY FOR THOSE PATIENTS WHO ARE EVACUEES FROM THE GULF COAST AREAS:

ACTIVE ED SURVEILLANCE FOR GULF COAST EVACUEES					
Hospital Name:					
ICP Name:					
ICP Phone #:					
ICP Pager #:					
Date pt seen @ ED	Presenting Complaints	Diagnoses	Pt Sex	Pt Age (or DOB)	Date Reported to MCDPH

Please coordinate with your ED to capture this information from emergency logs or encounter forms or from charts as may be appropriate to your hospital. For example, some hospitals may enter "evacuees" at the beginning of the complaints list in their electronic log; or those who have a manual system may want to flag the encounter form or the chart with a brightly colored piece of paper.

Thank you for your assistance in this matter and for your support of the hurricane relief efforts.

[Sent to MCDPH's surveillance e-mail list by MCDPH, September 5, 2005.]

Appendix II. Part B. MARICOPA COUNTY ACTIVE SURVEILLANCE
HURRICANE KATRINA EVACUEES (HKE)
Report for Friday 9/23/05

A. Facilities Reporting:

REPORT DATE	# HOSPITALS TREATING HKE PATIENTS IN THEIR ED	TOTAL # OF PATIENT VISITS
9/5/2005	4	12
9/6/2005	7	24
9/7/2005	3	27
9/8/2005	4	13
9/9/2005	7	12
9/10/2005	0	0
9/11/2005	0	0
9/12/2005	6	14
9/13/2005	3	10
9/14/2005	3	3
9/15/2005	2	4
9/16/2005	1	1
9/17/2005	0	0
9/18/2005	1	2
9/19/2005	4	8
9/20/2005	0	0
9/21/2005	0	0
9/22/2005	0	0
9/23/2005	0	0
TOTAL	**Not Applicable**	**130**

Appendix II. Part B. MARICOPA COUNTY ACTIVE SURVEILLANCE
HURRICANE KATRINA EVACUEES (HKE)
Report for Friday 9/23/05

B. Age Distribution:

Age breakdown by ED Date

	AGE n = 130						
ED DATE	≤1	2 - 9 y.o	10 - 19 y.o.	20 - 64 y.o.	≥65	Unknown	TOTAL
9/2/2005	1	-	-	-	-	-	**1**
9/3/2005	-	-	-	-	-	-	**0**
9/4/2005	1	2	2	17	6	-	**28**
9/5/2005	-	1	1	16	10	-	**28**
9/6/2005	-	-	1	7	2	-	**10**
9/7/2005	-	-	-	8	-	1	**9**
9/8/2005	-	-	-	12	2	-	**14**
9/9/2005	-	-	-	5	1	-	**6**
9/10/2005	-	-	-	5	1	1	**7**
9/11/2005	-	-	-	-	1	-	**1**
9/12/2005	1	-	-	3	1	-	**5**
9/13/2005	-	-	-	2	1	-	**3**
9/14/2005	1	-	-	3	-	-	**4**
9/15/2005	-	1	-	2	-	-	**3**
9/16/2005	1	-	-	1	1	-	**3**
9/17/2005	1	-	-	1	1	-	**3**
9/18/2005	-	-	-	1	-	-	**1**
9/19/2005	1	-	-	-	-	-	**1**
9/20/2005	-	-	-	-	-	-	**0**
9/21/2005	-	-	-	-	-	-	**0**
9/22/2005	-	-	-	-	-	-	**0**
9/23/2005	-	-	-	-	-	-	**0**
Unknown	-	-	-	1	2	-	**3**
Total	**7**	**4**	**4**	**84**	**29**	**2**	**130**

Appendix II. Part B. MARICOPA COUNTY ACTIVE SURVEILLANCE
HURRICANE KATRINA EVACUEES (HKE)
Report for Friday 9/23/05

B. Age Distribution: (cont'd)

Age breakdown by Report Date

REPORT DATE	AGE n = 130 ≤1	2 - 9 y.o.	10 - 19 y.o	20 - 64 y.o.	≥65	Unknown	TOTAL
9/5/2005	-	-	-	8	4	-	**12**
9/6/2005	2	2	2	10	8	-	**24**
9/7/2005	-	1	2	19	5	-	**27**
9/8/2005	-	-	-	10	3	-	**13**
9/9/2005	-	-	-	10	1	1	**12**
9/10/2005	-	-	-	-	-	-	**0**
9/11/2005	-	-	-	-	-	-	**0**
9/12/2005	-	-	-	10	3	1	**14**
9/13/2005	1	-	-	7	2	-	**10**
9/14/2005	-	-	-	2	1	-	**3**
9/15/2005	1	-	-	3	-	-	**4**
9/16/2005	-	1	-	-	-	-	**1**
9/17/2005	-	-	-	-	-	-	**0**
9/18/2005	2	-	-	-	-	-	**2**
9/19/2005	1	-	-	5	2	-	**8**
9/20/2005	-	-	-	-	-	-	**0**
9/21/2005	-	-	-	-	-	-	**0**
9/22/2005	-	-	-	-	-	-	**0**
9/23/2005	-	-	-	-	-	-	**0**
Total	**7**	**4**	**4**	**84**	**29**	**2**	**130**

Appendix II. Part B. MARICOPA COUNTY ACTIVE SURVEILLANCE
HURRICANE KATRINA EVACUEES (HKE)
Report for Friday 9/23/05

C. Gender Distribution:

Gender distribution by report date

GENDER (n=130)			
REP.	MALE	FEMALE	TOTAL
9/5/2005	5	7	12
9/6/2005	14	10	24
9/7/2005	15	12	27
9/8/2005	8	5	13
9/9/2005	8	4	12
9/10/2005	-	-	0
9/11/2005	-	-	0
9/12/2005	10	4	14
9/13/2005	5	5	10
9/14/2005	-	3	3
9/15/2005	2	2	4
9/16/2005	1	-	1
9/17/2005	-	-	0
9/18/2005	2	-	2
9/19/2005	5	3	8
9/20/2005	-	-	0
9/21/2005	-	-	0
9/22/2005	-	-	0
9/23/2005	-	-	0
Total	**75**	**55**	**130**

Gender distribution by age

TOTAL GENDER (n=130)			
AGE	MALE	FEMALE	TOTAL
<1 y.o.	5	2	7
2 - 9 y.o.	2	2	4
10 - 19	2	2	4
20 - 64	48	36	84
>65 y.o.	16	13	29
Unknown	2	0	2
TOTAL	**75**	**55**	**130**

Appendix II. Part B. MARICOPA COUNTY ACTIVE SURVEILLANCE
HURRICANE KATRINA EVACUEES (HKE)
Report for Friday 9/23/05

D. Diagnosis distribution by Date and Total to Date:

Dx	Dx List per ED Date																							TOTAL # TO DATE
	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	Unknown[4]	
Cancer								1																1
Cardiac			1	1	1		2	1						1		1								8
Check-up			1				1																	2
Chronic			7	6		3	3		1		2		1										1	24
Dehydration			2	5			1											1						9
Dental/Oral					1	1	1							1										4
Fatigue/weakness			3	2					1					1										7
Fever			1						1															2
Genitourinary					1				1		1					1								4
GI			4	3	3	2		1		1					1	1		1						17
Immunization						1																		1
OB/GYN			1		1		1		1						1									5
Other[2]			5	3	1	2	5	2	1		1	2		2									1	25
Psychiatric/Mental				2		1			1		1						1							6
Pulmonary							1																	1
Respiratory	1		1	4		2	3	1	2				1		1	1								17
Rx refill			2				1				1													4
Sensory[5]			1										1											2
Skin infection				2	1	1		1															1	6
Trauma			4	3	1	1	1							1										11
Unknown[3]							2	1			1	1	1		1									7
TOTAL[1]																								**163**

NOTES: [1]Patients can have more than one diagnosis; [2]Post-op, unspecified leg pain, abdominal pain, lymphadenopathy, memory problems, severe anemia, opiate withdrawal, fistula, hypokalemia, ; [3]Left clinic w/out treatment, pending diagnosis; [4]ED date not provided; [5]Sensory category includes eye, ear, nose complications such as hyphema, and otitis media.

As the daily reports are being received, the diagnosis list is being refined, especially those diagnoses in the "other" category. As such, the numbers per category may fluctuate, i.e. a fatigue/weakness category now exists, so general weakness is no longer in the "other" category.

Appendix III. Figure A. ADHS Medical intake form (side A)

NAME:				FEMA #:				
AGE:				DATE OF SERVICE:				
DATE OF BIRTH:				TIME OF SERVICE:				
COT LOCATION:				INITIAL CLINIC VISIT:				
GENDER:				FOLLOW-UP CLINIC VISIT:				
CHIEF								
VITAL SIGNS	BP=		P=		T=		R=	
	Pulse Ox:			Glucometer:				
ALLERGIES:								
MEDICATIONS:								
PAST MEDICAL HISTORY:								
☐	CHF	☐	Diabetes		☐ Hospitalizations			
☐	Active Alcohol/Drug Use							
☐	HTN	☐ Asthma	☐ TB	☐ HIV				
☐	Other Immunocompromised Conditions							
☐	Other Communicable diseases				☐ Surgeries			
☐	Other Illnesses/Injuries							
LAST:	TETANUS SHOT=				VACCINATIONS UTD		YES	NO
	MENSTRUAL PERIOD (LMP) =				Pregnant		YES	NO
PROVIDER EVALUATION for SYNDROMIC SURVEILLANC		Fever	YES	NO	Cough		YES	NO
		Jaundice	YES	NO	Headache		YES	NO
		Diarrhea	YES	NO	Rash		YES	NO
		Vomiting	YES	NO	Neurological		YES	NO
		Conjunctivitis	YES	NO	Oth Upper Resp Illness		YES	NO

Appendix III. Figure A. ADHS Medical intake form (side B)

DIAGNOSIS:					
PHYSICIAN TREATMENT ORDERS:					
			COMPLETED?		
			DATE:	TIME:	INITIALS:
PHYSICIAN PRESCRIPTION ORDERS:					
SPECIMENS COLLECTED: Y / N TYPE:					
REMARKS:					
DISPOSITION/FOLLOW - UP PLAN:					
PHYSICIAN SIGNATURE:			DATE/TIME:		
PRINT PHYSICIAN NAME:					

Appendix III. Figure B. Tool for Surveillance Among Facilities Housing Hurricane Katrina Evacuees (OMB 0920-0008, V2.0 09/09/2005)

Tool for Surveillance Among Facilities Housing Hurricane Katrina Evacuees

SUBMIT THIS FORM DAILY BY FAX TO 770-488-7107 OR BY EMAIL TO EOCANALYSIS@CDC.GOV

If unable to fax or email, or to report unusual disease occurrences, please call 770-488-7100.

Facility name: _____ Phone:_____-_____-_____ Fax:_____-_____-_____

Email:_____ Reported by: _____

CURRENT FACILITY CENSUS: TOTAL: _____ AGE: ?2 y _____ >65 y: _____

RACE: White _____ Black: _____ Am Ind: _____ Asian: ____ Other: _____ HISPANIC ETHNICITY: _____

24 hr reporting period: Date: ___ /___/____ Time _____am pm (circle one) **TO** ___/ ___/____ Time_____am pm

INSTRUCTIONS: You may count a person more than once BUT be as specific as possible. ***For example, if you suspect measles, classify as such, otherwise classify as rash illness; OR if person has more than one GI symptom, select the most severe.***

Syndrome Category	# patients with condition
Epidemic Disease Potential	
Fever >100.4° F (38° C) ALONE without localizing signs/ symptoms.	___ ___ ___
Gastrointestinal Illness	___ ___ ___
Watery Diarrhea (3 or more watery bowel movements per day) AND vomiting	___ ___ ___
Watery Diarrhea with NO vomiting	___ ___ ___
Bloody Diarrhea, +/- vomiting	___ ___ ___
Respiratory illness	___ ___ ___
Upper respiratory or influenza-like illness (fever + either cough or sore throat)	___ ___ ___
Tuberculosis, suspected (cough ≥3 weeks, fever/chills, night sweats, recent weight loss)	___ ___ ___
Pertussis, suspected (whooping cough; chronic cough ≥ 2 weeks)	___ ___ ___
Lower respiratory tract illness (pneumonia; bronchiolitis/wheezing)	___ ___ ___
Viral hepatitis, suspected (jaundice, +/- fever)	___ ___ ___
Neurologic illness	___ ___ ___
Meningitis/encephalitis, suspected (fever, stiff neck, headache, mental status change)	___ ___ ___
Wound infections	___ ___ ___
Conjunctivitis (red eyes, ocular discharge)	___ ___ ___
Rash Illness	___ ___ ___
Suspect chickenpox (vesicular rash)	___ ___ ___
Suspect measles/rubella (maculopapular rash)	___ ___ ___
Scabies	___ ___ ___
Lice	___ ___ ___
Other Illness (*please specify*): _____	___ ___ ___
Mental Health / Psychological Problems	
Mental Health	___ ___ ___
Anxiety / Depression / Insomnia	___ ___ ___
Substance abuse / withdrawal	___ ___ ___
Disorientation / Confusion	___ ___ ___
Acute psychosis / Suicidal or Homicidal	___ ___ ___
Violent behavior	___ ___ ___
Injury / Chronic Disease / Other	
Injury	___ ___ ___
Self-inflicted injury – Intentional (violence)	___ ___ ___
Assault-related injury – Intentional (violence)	___ ___ ___
Unintentional injury (accidents)	___ ___ ___
Heat related injury (not dehydration)	___ ___ ___
Diabetes Mellitus	___ ___ ___
Asthma / COPD	___ ___ ___
High Blood Pressure and other Cardiovascular Diseases	___ ___ ___
Dehydration	___ ___ ___

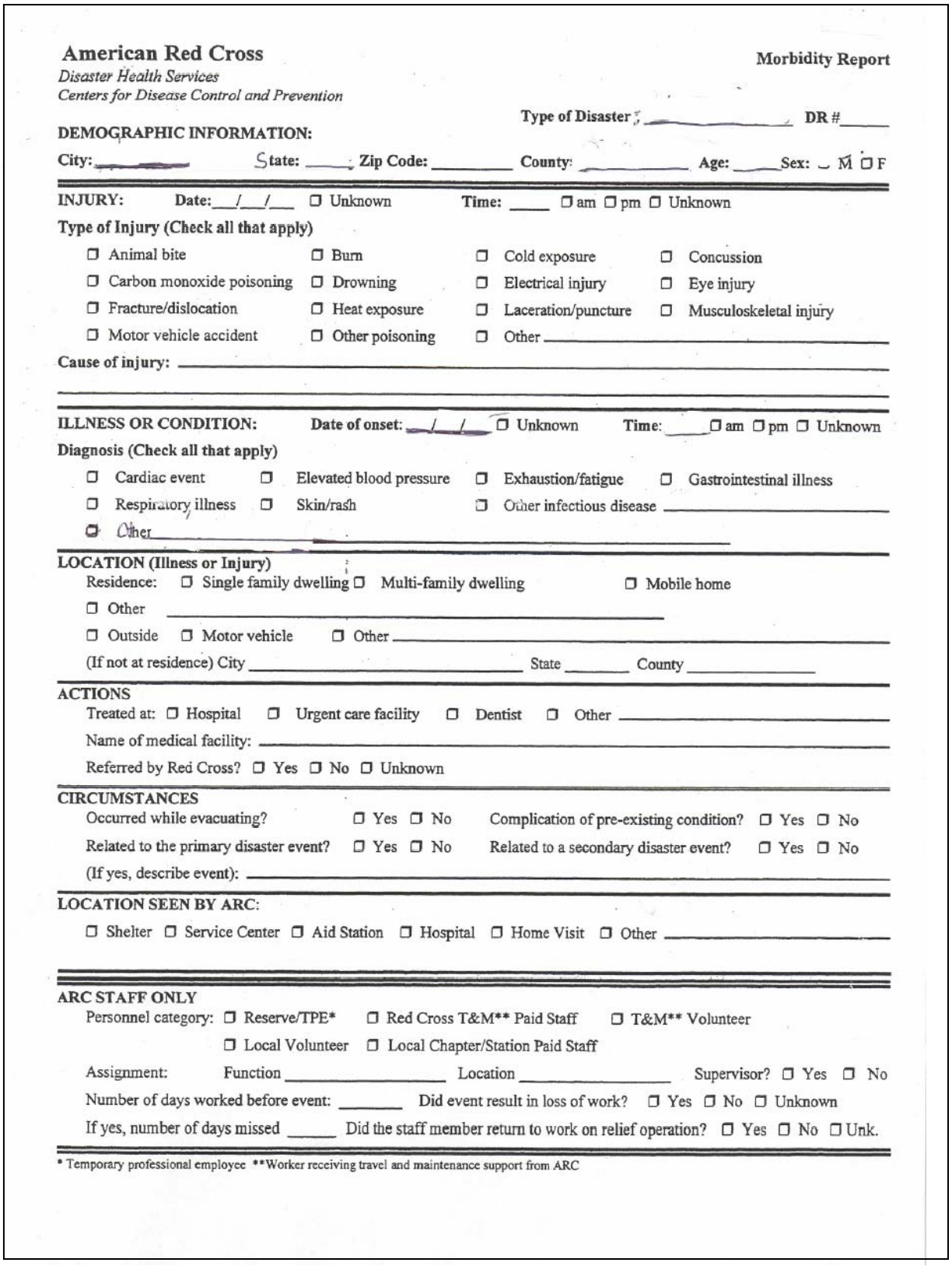
Are you concerned about a possible outbreak? (*Please describe*): _____

Total number of patients treated in past 24 hour period: _____ Total number of deaths during past 24 hours: _____

Do you need assistance with, or additional resources for any of the following:

	Yes	No		Yes	No
Physician staffing	?	?	Nursing staffing	?	?
Pharmacist staffing	?	?	Mental Health staffing	?	?
Sanitation/Environmental health	?	?	Medications/Drugs/Pharmacy supply	?	?

Appendix III. Figure C. Red Cross First Aid station form



American Red Cross — **Morbidity Report**

Disaster Health Services
Centers for Disease Control and Prevention

Type of Disaster: _____ DR #_____

DEMOGRAPHIC INFORMATION:

City: _____ State: _____ Zip Code: _____ County: _____ Age: _____ Sex: ❒ M ❒ F

INJURY: Date: __/__/__ ❒ Unknown Time: _____ ❒ am ❒ pm ❒ Unknown

Type of Injury (Check all that apply)

❒ Animal bite ❒ Burn ❒ Cold exposure ❒ Concussion
❒ Carbon monoxide poisoning ❒ Drowning ❒ Electrical injury ❒ Eye injury
❒ Fracture/dislocation ❒ Heat exposure ❒ Laceration/puncture ❒ Musculoskeletal injury
❒ Motor vehicle accident ❒ Other poisoning ❒ Other _____

Cause of injury: _____

ILLNESS OR CONDITION: Date of onset: __/__/__ ❒ Unknown Time: _____ ❒ am ❒ pm ❒ Unknown

Diagnosis (Check all that apply)

❒ Cardiac event ❒ Elevated blood pressure ❒ Exhaustion/fatigue ❒ Gastrointestinal illness
❒ Respiratory illness ❒ Skin/rash ❒ Other infectious disease _____
❒ Other _____

LOCATION (Illness or Injury)

Residence: ❒ Single family dwelling ❒ Multi-family dwelling ❒ Mobile home
❒ Other _____
❒ Outside ❒ Motor vehicle ❒ Other _____
(If not at residence) City _____ State _____ County _____

ACTIONS

Treated at: ❒ Hospital ❒ Urgent care facility ❒ Dentist ❒ Other _____
Name of medical facility: _____
Referred by Red Cross? ❒ Yes ❒ No ❒ Unknown

CIRCUMSTANCES

Occurred while evacuating? ❒ Yes ❒ No Complication of pre-existing condition? ❒ Yes ❒ No
Related to the primary disaster event? ❒ Yes ❒ No Related to a secondary disaster event? ❒ Yes ❒ No
(If yes, describe event): _____

LOCATION SEEN BY ARC:

❒ Shelter ❒ Service Center ❒ Aid Station ❒ Hospital ❒ Home Visit ❒ Other _____

ARC STAFF ONLY

Personnel category: ❒ Reserve/TPE* ❒ Red Cross T&M** Paid Staff ❒ T&M** Volunteer
❒ Local Volunteer ❒ Local Chapter/Station Paid Staff
Assignment: Function _____ Location _____ Supervisor? ❒ Yes ❒ No
Number of days worked before event: _____ Did event result in loss of work? ❒ Yes ❒ No ❒ Unknown
If yes, number of days missed _____ Did the staff member return to work on relief operation? ❒ Yes ❒ No ❒ Unk.

* Temporary professional employee **Worker receiving travel and maintenance support from ARC

Appendix IV. Figure A. Shelter infection control plan

Infection Control Plan: Shelter

I. Purpose:
The purpose is to prevent exposure to and transmission of infectious agents in a shelter setting. The basic infection control principles of hand hygiene, respiratory hygiene and standard precautions will prevent the spread of disease in shelters. Education of shelter evacuees, volunteers, healthcare and emergency workers is an important part of this plan.

II. Supplies*
Hygiene tables:
- Cover your cough poster
- Tissues
- Large bottle of hand sanitizer (at least 60% alcohol)
- Disinfectant (Clorox cleanup preferred-cleans/disinfects at once)
- Paper towels
- Waste cans
- Tables (approximately 3' x 3')

Clinic rooms and triage
- Tissues
- Hand sanitizer (at least 60% alcohol)
- Disinfectant
- Paper towels
- Waste cans
- "Disinfectant Supplies" sign

Sinks
- Non antimicrobial soap
- Paper towels
- Waste cans

Misc. tables
- Tissues
- Hand sanitizer
- Cover your cough poster
- Handwashing posters

Personal Protective Equipment
- Latex and non latex gloves
- Fluid impermeable gowns
- Surgical masks
- N95 masks
- Face shields/ goggles

*Check expiration dates of disinfectants and hand sanitizers. Efficacy is not guaranteed past expiration dates.

Note: **Disinfectant wipes should not be used**. The wipes require a **wet** contact time of five minutes (read product label) to disinfect, so they are not effectively killing germs in our climate.

III. Hand Hygiene

It is best to wash hands with regular soap and water. If water is unavailable, use an alcohol based hand sanitizer. Hand sanitizer must have at least 60% alcohol. **Do not use rubbing alcohol.**

Appendix IV. Figure A. Shelter infection control plan

IV. Cleaning and Disinfection

If a surface gets contaminated, it must be cleaned and disinfected. Many disinfectants don't work if there is blood, stool or urine present. These surfaces must be cleaned first and then disinfected. Clorox cleanup cleans and disinfects at one time. Bleach is also recommended for cleaning surfaces possibly contaminated with Norovirus. All disinfectants require a contact time from 1-10 minutes. Read the disinfectant label to determine the recommended contact time. Most bleach products requires a contact time of 5 minutes.

V. Infectious Waste

Red bags are not necessary in the clinic. In the shelter setting, only sharps and gauze with free flowing blood are considered infectious waste in Arizona. (A.A.C. R18-13.1401). Red bags are available in the supply room if needed.

VI. Standard Precautions

Standard Precautions should be applied to all residents to protect residents and staff from contact with recognized and unrecognized infections. Personal protective equipment is available in the clinic (e.g., gloves, gowns, masks, face shields) and should be used if contact with blood and body fluids is anticipated.

VII. Respiratory Hygiene

Respiratory Hygiene applies to everyone with a cough illness. Covering nose and mouth with a tissue, discarding the tissue in the waste can, and washing hands are integral in stopping the spread of respiratory illness. Masking a patient with a surgical mask (not N95) will be necessary when transferring the patient to triage and to the hospital.

VIII. Sleep equipment
Sleep equipment (e.g., cots, sleeping bags) should be used only by a single person and should be cleaned and sanitized before being assigned to another person. Mattresses must be cleaned and sanitized when soiled and wet.

IX. Pediatric issues

Toys can transmit disease. Toys that are placed in children's mouths or otherwise contaminated by body secretions should be cleaned with water and detergent, disinfected, and rinsed before handling by another child. All frequently touched toys should be cleaned and disinfected daily. The use of soft, non washable toys should be discouraged. These toys may be given to the child.

Diaper Changing Surfaces should be nonporous and sanitized between uses. Alternatively, the diaper changing surface should be covered with disposable paper pads, which are discarded after each use. If the surface becomes wet or soiled, it should be cleaned and sanitized.

Play areas should be cleaned and sanitized daily.

X. Staff Illness

If volunteers , emergency or healthcare workers are sick….stay home!!!

XI. Infection Control Questions
An infection control practitioner is available on cell phone 24/7 for specific questions.

Appendix IV. Figure A. Shelter infection control plan

XII Infection Control Rounds.
The infection control practitioner or her designee will conduct infection control rounds at the shelter twice daily.

Rounds include:

1. Discussion with clinic staff about infectious disease cases
2. Checking supplies at hygiene tables and refilling as necessary
3. Discussion with Red Cross Staff about infectious disease issues
4. Checking for hygiene supplies at other shelter locations including: phone banks, behavioral health, faith based groups, and security.
5. Bathroom and shower check for supplies and cleanliness.

Any problems encountered that the ICP cannot remedy, should be discussed with the onsite clinic PHIMS manager.

Attachments:

Hand Hygiene in Emergency Settings
http://www.bt.cdc.gov/disasters/hurricanes/pdf/handwashing.pdf

Infection Control Prevention Guidance for Community Shelters following Disasters
http://www.bt.cdc.gov/disasters/pdf/commshelters.pdf

Respiratory Hygiene/Cough Etiquette in Healthcare Settings
http://www.cdc.gov/flu/professionals/pdf/resphygiene.pdf

Cover your Cough poster

Handwashing poster

Disinfectant supply sign

Appendix IV. Figure B. Daily infection control assessment

Infection Control Assessment

- ☐ **Discussion with clinic staff about infectious disease cases**
- ☐ **Discussion with Red Cross Staff about infectious disease issues**
- ☐ **Checking supplies at hygiene tables and refilling as necessary**
  - ☐ **Cover your cough poster**
  - ☐ **Tissues**
  - ☐ **Large bottle of hand sanitizer (at least 60% alcohol)**
  - ☐ **Disinfectant**
  - ☐ **Paper towels**
- ☐ **Checking for hygiene supplies at other shelter locations including: phone banks, behavioral health, faith based groups, and security.**
  - ☐ **Tissues**
  - ☐ **Hand sanitizer**
  - ☐ **Cover your cough poster**
  - ☐ **Handwashing posters**
- ☐ **Bathroom and shower check for supplies and cleanliness.**
  - ☐ **Regular soap**
  - ☐ **Paper towels**
  - ☐ **No hand sanitizer**
- ☐ **Clinic Room and Triage**
  - ☐ **Tissues**
  - ☐ **Hand sanitizer (at least 60% alcohol)**
  - ☐ **Disinfectant**
  - ☐ **Paper towels**
  - ☐ **"Disinfectant Supplies" sign**
  - ☐ **Latex and non latex gloves**
  - ☐ **Fluid impermeable gowns**
  - ☐ **Surgical masks**
  - ☐ **N95 masks**
  - ☐ **Face shields/ goggles**